University of California Agriculture and Natural Resources

CALIFORNIA 4-H PROJECT SHEET SERIES
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UC PEER REVIEWED

4-H Scientific Literacy Project

Youth need to understand science, technology, engineering, and mathematics (STEM) concepts and know how to use scientific and engineering thinking to address important societal concerns. The 4-H scientific literacy project introduces 4-H members to important concepts through engaging in reasoning skills to help improve attitudes for and interest in STEM. Through this project, youth apply their learning to real-world issues.

- Youth develop science-related conceptual understanding associated with issues relevant to their respective 4-H projects, their own lives, and to the citizens of California.
- Youth strengthen their scientific reasoning, the cognitive skills needed to understand and evaluate scientific information.
- Youth apply their knowledge and skills to real-world problems to gain a deeper understanding of STEM.

Starting Out *Beginner*	Learning More *Intermediate*	Exploring Depth *Advanced*
• Spark young people's interest in STEM through hands-on and experiential activities. • Focus on engaging youth in science process skills, such as observing, communicating, comparing, ordering, categorizing, relating, inferring, applying. • Visit science centers, museums, and other science-related places. • Invite a scientist or engineer to speak.	• Deepen young people's interest in STEM through longer-term projects where they can ask questions; plan and carry out investigations; analyze and interpret data; construct explanations; and communicate information. • Invite youth to use scientific and engineering tools. • Use scientific and engineering terms and concepts.	• Sustain young people's STEM interest with scientific investigations and engineering design. • Engage in a citizen science project. • Explore community issues; design and implement a scientific exploration to address relevant questions. • Facilitate hands-on STEM activities with younger youth.

The activities above are ideas to inspire further project development. This is not a complete list.

4-H THRIVE

Help Youth:

Light Their Spark

A spark is something youth are passionate about; it really fires them up and gives them joy and energy. Help youth find how this project excites them.

Flex Their Brain

The brain grows stronger when we try new things and master new skills. Encourage youth effort and persistence to help them reach higher levels of success.

Reach Their Goals

Help youth use the GPS system to achieve their goals.

Goal Selection: Choose one meaningful, realistic and demanding goal.

Pursue Strategies: Create a step-by-step plan to make daily choices that support your goal.

Shift Gears: Change strategies if you're having difficulties reaching your goal. Seek help from others. What are youth going to do when things get in their way?

Reflect

Ask project members how they can use their passion for this project to be more confident, competent and caring. Discuss ways they can use their skills to make a contribution in the community, improve their character or establish connections.

Expand Your Experiences!

Science, Technology, Engineering, and Mathematics

- Explore the history and development of a scientific tool or theory.
- Hold a townhall-style debate on a socioscientific issue (like climate change) where each person represents a stakeholder group (engaging in argumentation from evidence).
- Learn about scientific norms—like C.U.D.O.S.

Healthy Living

- Find ways to use science or engineering to improve the health of your community.
- Research how scientific advancements have helped improve our standard of living.
- Coordinate a GIS project to map local sources of fresh fruits and vegetables.

Citizenship

- Discover the science-rich institutions in your community. Find methods to increase youth participation in interacting with these places.
- Identify community needs and plan a scientific investigation or engineering design to address the issue.

Leadership

- Become a Junior or Teen Leader.
- Plan, prepare, and present a Science or Engineering Presentation at a 4-H presentation day.
- Lead a 4-H National Youth Science Day event in your community- www.4-H.org/NYSD.

Resources

- 4-H STEM Resources 4h.ucanr.edu/Projects/STEM/Professional_Development/
- Understanding Science http://undsci.berkeley.edu/
- How to Smile www.howtosmile.org/
- 50 Ways to Include STEM in Service Learning 4h.ucanr.edu/files/117133.pdf
- USA Science and Engineering Festival www.usasciencefestival.org/
- Exploratorium Education http://www.exploratorium.edu/
- SciGirls http://pbskids.org/scigirls/home
- Citizen Science CitizenScience.org
- Click2Science Resources http://www.click2sciencepd.org/
- Techbridge http://www.techbridgegirls.org/
- ScienceFriday http://www.sciencefriday.com/
- Science Buddies http://www.sciencebuddies.org/

Connections & Events

Apply for a 4-H Golden Clover Award in the Brownlee Science category.

Presentation Days – Share what you've learned with others through a presentation.

Field Days – 4-H members may participate in a variety of contests related to their project area.

Contact your UC Cooperative Extension office to determine additional opportunities available, such as a field day.

Curriculum

- For K-3rd grade youth: Youth Experiences in Science- http://4h.ucanr.edu/Resources/Curriculum/FREE/4-H_Youth_Experiences_in_Science_2000/
- There's No New Water! http://www.4-h.org/resource-library/curriculum/4-h-theres-no-new-water/
- Explore It! Curriculum http://npass2.edc.org/curriculum

4-H Record Book

4-H Record Books give members an opportunity to record events and reflect on their experiences. For each project, members document their experiences, learning and development.

4-H Record Books also teach members record management skills and encourage them to set goals and develop a plan to meet those goals.

To access the 4-H Record Book online, visit http://ucanr.edu/orb/

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